

## Claims

- [c1] We claim:
1. A precision variable rate dispensing apparatus comprising:  
 a support member;  
 an eductor connected to the support member, the eductor having a liquid inlet,  
 an inlet for liquid concentrate and an outlet for a mixed solution;  
 a needle valve assembly in fluid communication with the inlet for liquid  
 concentrate, the needle valve assembly including a valve body, a needle  
 member for reciprocal movement with respect to a passage to vary flow  
 therethrough, a cam follower portion connected to the needle member;  
 a cam member positioned between the cam follower portion and the passage,  
 the needle member constructed and arranged so that when the needle member  
 is turned in one direction, with the cam follower portion contacting the cam  
 member and the needle member moving in one direction, the needle member  
 will move away from the passage to increase flow through the valve and when  
 the needle member is turned in the opposite direction the needle member will  
 move in the direction of the passage to reduce flow through the valve.
- [c2] 2. The dispensing apparatus as defined in claim 1 wherein the cam member is  
 constructed and arranged so that a single revolution of the needle portion will  
 cause a full operation of the valve.
- [c3] 3. The dispensing apparatus as defined in claim 1 wherein the cam follower is  
 defined by a flange member extending from the needle portion.
- [c4] 4. The dispensing apparatus as defined in claim 1 wherein the needle valve  
 assembly is positioned in a parallel manner with respect to the eductor.
- [c5] 5. The dispensing apparatus as defined in claim 1 wherein the needle valve  
 assembly is positioned in a perpendicular manner with respect to the eductor.
- [c6] 6. The dispensing apparatus as defined in claim 1 wherein a dial member is  
 connected to the needle portion outside of the valve body.
- [c7] 7. The dispensing apparatus as defined in claim 1 wherein the valve body is  
 interconnected to the eductor at one end of the eductor and the inlet for liquid

- concentrate to a side of the valve body.
- [c8] 8. The dispensing apparatus as defined in claim 1 wherein the cam member is defined by a one piece, ramped, annular component.
- [c9] 9. A precision variable rate dispensing apparatus comprising:  
a support member;  
an eductor connected to the support member, the eductor having a liquid inlet,  
an inlet for liquid concentrate and an outlet for a mixed solution;  
a needle valve assembly in fluid communication with the inlet for liquid concentrate, the needle valve assembly including a valve body, a needle member for passage to vary flow therethrough;  
a cam follower portion connected to the needle member;  
a cam member positioned between the cam follower member and the passage, the cam member having a cam surface with a first degree slope and a rapidly increasing slope;  
the cam member and cam follower portion constructed and arranged so that when the needle member is turned in one direction, with the cam follower portion contacting the cam member, the valve will increase flow therethrough and when the needle member is turned in the opposite direction the valve will decrease flow therethrough.
- [c10] 10. The dispensing apparatus as defined in claim 9 wherein the second degree slope of the cam surface terminates in an end wall connected to the first degree slope.